

X.—*Ornithological Results of the Scottish National Antarctic Expedition.*—II. *On the Birds of the South Orkney Islands.* By WM. EAGLE CLARKE, F.R.S.E., F.L.S., Royal Scottish Museum*.

(Plates III.—XIII.)

THE South Orkneys (see Plate V.) are a group of over a dozen islands situated between 60° and 61° S. lat., and $43^{\circ} 3'$ and 47° W. long. They lie some 600 miles S.E. by E. of the Falkland Islands, about 500 S.W. of South Georgia, and 200 E. of the South Shetlands. They were discovered by Powell in 1821, and were visited by Weddell in 1823, by Dumont D'Urville in 1838, and by Larsen in 1893. The descriptions furnished by these explorers were, however, meagre in the extreme, and until the visit of the Scottish expedition the South Orkneys remained among the least-known lands lying on the fringe of the South Polar Sea.

So far as their Ornis is concerned only two species of birds, and one of these problematical, have hitherto been alluded to—namely, the Ringed Penguin (*Pygoscelis antarctica*), of which a specimen was obtained on Weddell I. by D'Urville, and a Crested Penguin (*Catarrhactes*) described by Larsen.

The 'Scotia' visited the islands on her voyage south in February 1903; subsequently, having completed her first Antarctic cruise, she returned to the Archipelago towards the end of March and went into winter-quarters, remaining there for eight months, during which period much valuable geographical and zoological work was accomplished.

Only two of the islands are of considerable size—namely, Coronation I., which is the most westerly, and Laurie I., the most easterly.

Laurie I., where the 'Scotia' wintered, was the main scene of the labours of the expedition, and it is almost entirely upon observations and collections made during eleven months' residence there that the following contribution is

* For Part I. "The Birds of Gough Island," see 'The Ibis,' 1905, pp. 247-268.

based. The length of this island is about 12 miles, its maximum breadth 6 miles, and its area fully 30 square miles. The interior is lofty, and several of the summits reach to an altitude of from 2000 to 3000 feet. A number of deep bays run inland from north to south, separated by narrow rocky peninsulas or steep lofty mountain-ranges, and cause the island to have a very remarkable outline. All the valleys are choked by glaciers, and what little exposed rock is visible is precipitous in the extreme. Here and there on the lower slopes and at sea-level are a few acres of more or less level ground. In winter the whole island and even the faces of the precipitous cliffs are covered with snow, which does not commence to disappear till October and November (the late spring and early summer months); but then many patches of moss-covered ground are laid bare, some of them bearing soil from six to ten inches deep. Except this vegetable mould, there is little soil anywhere. The rocks, various kinds of graywacke, are mostly covered with lichens, especially *Usnea*, which, with various species of moss, form the entire terrestrial flora of the island.

Concerning climatic conditions, Mr. Mossman informs me that, in spite of their low latitude, the climate of the South Orkneys is essentially polar. One of the most powerful factors in determining the temperature of the air over this region is the cold antarctic current which carries streams of ice and numerous icebergs to a latitude corresponding with that of the northern part of England. The mean annual temperature, based on nearly two years' observations, was found to be $22^{\circ}\cdot7$ F., the means of the seasons being summer $31^{\circ}\cdot4$, autumn $22^{\circ}\cdot7$, winter $13^{\circ}\cdot7$, and spring $23^{\circ}\cdot3$. The most remarkable feature was the low and equable summer temperature, which rarely rises above 37° or falls below 25° . In winter, owing to the freezing up of the sea to the south, the islands are virtually on the edge of a continent, and the temperature at that season is thus characterised by great variability, the range of the thermometer frequently exceeding 60° in twenty-four hours. If the wind is in the south, very low temperatures, as low as 40° below zero F., are recorded; but with a change of wind to the north the

thermometer may rise, even in the depth of winter, above the freezing-point. Summer is characterised by almost continuously overcast skies, and the finest and clearest weather occurs in winter. Owing to the large amount of cloud which hangs over the islands in summer, the temperature is much the same as at places ten degrees further south. The snow-fall is excessive, the sunshine is very deficient, and strong gales are frequent.

The first landing on the archipelago was effected at Saddle I., which was fortunately clear of ice, on February 1th, 1903. Here the explorers were met by a host of Ringed Penguins (*Pygoscelis antarctica*), which had a large "rookery," where many young and some eggs were found. Cape Petrels or "Pigeons" (*Daption capensis*), Sheathbills (*Chionis alba*), and Skuas (*Megalestris antarctica*) were also nesting, and specimens of both young and old were obtained. Gulls (*Larus dominicanus*), Giant Petrels (*Ossifraga gigantea*), and Shags (*Phalacrocorax atriceps*) were observed on the adjacent islets and rocks, and were apparently nesting there.

From Saddle I. the 'Scotia' sailed for the far south, and, having made a successful voyage in the southern waters of the Weddell Sea, the Expedition returned to the South Orkneys on March 21st. This was followed by a quest for suitable winter-quarters, during which Lewthwaite Strait and the east side of Coronation I. were explored, and, finally, on March 25th, a bay, afterwards named "Scotia Bay," on the south coast of Laurie I. (see map Plate V.) was selected.

It was now autumn and the birds were beginning to emigrate in search of more genial winter-quarters to more northern latitudes, or, in the case of some species, the nearest open water to the archipelago, wherever that may have been. Even in mid-winter (June and July) Laurie I. was not devoid of feathered inhabitants, for the following birds were observed more or less frequently, though not abundantly:—Snowy Petrels (*Pagodroma nivea*), Giant Petrels (*Ossifraga gigantea*), Gulls (*Larus dominicanus*), and Sheathbills (*Chionis alba*). The Skuas (*Megalestris antarctica*) and the Ringed Penguins (*Pygoscelis antarctica*) departed during the last days of April,

and were followed by the Cape Petrel (*Daption capensis*) and the Adélie and Gentoo Penguins (*Pygoscelis adeliæ* and *P. papua*).

The first spring immigratory movements took place in October, when Cape Petrels, Adélie and Gentoo Penguins, Skuas, and Terns (*Sterna hirundinacea*) arrived in the order indicated, the last-named at the very end of the month. These were followed in November by Wilson's Petrel (*Oceanites oceanicus*), the Ringed Penguin, and the Silver Petrel (*Priocella glacialisoides*).

With the return of spring the explorers were busy and journeys were undertaken in various directions, while a camp was established on the northern shore of the island, which was productive of excellent ornithological results, but had unfortunately to be abandoned at an interesting period on account of the break up of the ice.

After having been icebound for eight long months, the 'Scotia' was liberated on November 23rd, 1903, and immediately departed for the Falklands and Buenos Ayres to refit; but a party under the charge of Mr. Mossman, the meteorologist, and Dr. Harvey Pirie, the medical officer and geologist, was left to carry on the various observations and investigations and to make collections throughout the summer months. It is to the assiduous labours of Dr. Pirie that we owe most of our knowledge of the bird-life of the island during this most interesting part of the year, and he has earned the best thanks of ornithologists for the vast amount of valuable work which he accomplished.

During the summer bird-life was extremely abundant. Rookeries of the three species of Penguin (*Pygoscelis*) were numerous on the low rocky shores and less steep cliffs on various parts of the coast. Some of these bird-cities contained several millions of inhabitants, and their daily life presented scenes so remarkable as to be almost beyond description. The cliffs and their screes were the home of several species of Petrel, which resorted in great numbers to the ledges and crannies for nesting-sites, and the shores were the abode of the Gull, the Skua, and the Tern.

The Ringed Penguin, hitherto regarded as being nowhere an abundant species, was found to have its metropolis at the South Orkneys, where the summer population on Laurie I. alone was estimated at not less than one million birds.

The finding of the eggs of the familiar Cape Petrel (hitherto unknown to science) and of the chicks and young of the Ringed Penguin and the Snowy Petrel, the remarkable extension of the known range of the Macaroni Penguin (*Catarrhactes chrysolophus*) and of *Fregetta melanogaster* (which was undoubtedly breeding) were also among the results of the summer's work. Eggs of Wilson's Petrel, the Sheathbill, the Blue-eyed Shag (*Phalacrocorax atriceps*), and other well-known Antarctic species were also obtained, some of them in great abundance. The collection of bird-skins, too, was largely augmented.

The series of bird-skins is one of the most important ever made in the Antarctic Seas. It comprises one hundred and forty-three specimens, representing sixteen out of the eighteen species now known to frequent the islands and their immediate vicinity; while the eggs number several thousands. Many of the skins afford additional information concerning little-known phases in the plumage of several species, and enable me to describe for the first time the young or immature stages of others, such as the Ringed Penguin, Shag, Snowy Petrel, and so forth.

Add to the above slight summary of the bird-work accomplished the innumerable notes on and accounts of the nidification and other habits of not a few little-known species, and the investigations on their periods of incubation and the dates of their arrival at and departure from their summer-haunts, and we have an outline of the Ornithological Results obtained by the Scottish National Antarctic Expedition at the South Orkneys—results of the first importance, and meriting the full recognition, the sincere thanks, and the most hearty congratulations of all interested in our favourite science.

On the return of the 'Scotia' from the Falklands, the members of the Expedition, save Mr. Mossman and

another, embarked, and the South Orkneys were finally quitted on February 22nd, 1903, for the southern shores of the Weddell Sea—the Antarctic Continent, the then-discovered Coats Land.

In the preparation of this contribution I feel conscious that I have laboured under one very great disadvantage, namely, that of not having been a member of the Expedition, a circumstance which must naturally result in unavoidable shortcomings. Much valuable information, both written and verbal, has, however, been placed at my disposal, including the official Zoological Log and full and interesting notes from the private diaries of Mr. Bruce, Dr. Pirie, Mr. Rudmose Brown, Mr. Wilton, and Mr. Mossman. Mr. Mossman, at the request of the Argentine Government, spent a second winter and summer at Laurie I., engaged in meteorological and magnetic work, and he has most kindly supplied me with some additional information on bird-life made after the departure of the Scottish Expedition. To all these friends I desire to express my deep indebtedness and my sincere thanks. My friend Mr. Norman B. Kinnear has also earned my acknowledgments for his assistance in classifying records.

I propose to conclude this section of my contribution by instituting a comparison between the avifauna of the South Orkneys with that of the nearest regions lying to the South and North of them, and with that of the Antarctic Continent.

Before proceeding to do this it will be well to remark that the avifauna of the South Orkneys, as at present known, comprises 19 species; of these 13, perhaps 15, are natives, *i. e.* breeding birds.

Turning our attention first to the south, and comparing the avifauna of the Orkneys with that of the South Shetlands, which lie to the south and west, we find a remarkable similarity between the ornithology of the two archipelagos. This similitude is no doubt due to analogous climatic and other conditions influencing both animal and vegetable life. As regards their bird-life, the two groups are practically identical, the Orkneys only claiming one nesting species which does not

occur in the Shetlands, namely, the Petrel *Fregetta melanogaster*; while I am not aware that the latter group possesses a single native species not found in the Orkneys.

When, however, we come to extend our ornithic survey to the nearest northern land, South Georgia I., the result is entirely different. Here we find that while there are 9* native birds common to both, South Georgia has at least 12 † which do not breed in the Orkneys, while the latter isles can only claim 3 which do not summer in Georgia, namely *Pygoscelis adeliæ*, *Phalacrocorax atriceps*, and *Sterna hirundinacea*. When we examine and compare the climatic conditions prevailing at these two stations we have the key to these marked differences. In South Georgia, though only six degrees north of the South Orkneys, the mean summer temperature, Mr. Mossman informs me, is 8°·8 higher, while autumn, winter, and spring are respectively 11°·6, 15°·9, and 10°·7 warmer. At South Georgia the lowest temperature recorded was 9°·9 above zero, while at the South Orkneys 40° below zero has been registered. In South Georgia no less than 13 species of flowering plants (Phanerogams) are known: in the South Orkneys not one.

Extending our survey in like manner to the far south, and comparing the avifauna of the South Orkneys with that of the Antarctic Continent, we find that the latter has only 3 native birds not summering in the Orkneys, namely the stately *Aptenodytes forsteri*, *Megalestris maccormicki*, and *Sterna macrura antistrophe* Reichenow. The birds common to both are also 3—*Pygoscelis adeliæ*, *Oceanites oceanicus*, and *Thalassæca antarctica*.

The final instalment of the ornithological results of the

* These are *Pygoscelis antarctica* and *P. papua*, *Fregetta melanogaster*, *Pagodroma nivea*, *Ossifraga gigantea*, *Daption capensis*, *Larus dominicanus*, *Megalestris antarctica*, and *Chionis alba*.

† *Aptenodytes patagonica*, *Catarrhactes chrysolophus* (possibly a breeder at the S. Orkneys), *Pelecanoides exsul*, *Garrodia nereis*, *Majaqueus æquinoctialis*, *Prion desolatus*, *Diomedea exulans*, *Phæbætria fuliginosa*, *Sterna vittata georgiæ*, "*Phalacrocorax carunculatus* Gm. (*P. albiventer* Less.)," *Querquedula catoni*, and *Anthus antarcticus*.

Scottish National Expedition will be devoted to the Birds of the Weddell Sea, southwards of the Orkneys, and Coates Land.

PYGOSCELIS ANTARCTICA (Forst.). (Plates IV., VI., & VII.)
Pygoscelis antarctica Cat. B. xxvi. p. 634.

The Ringed Penguin is an uncommon bird in collections, and has hitherto been regarded as not an abundant species anywhere within the somewhat limited area in which it occurs; while its phases of plumage were little known except in the adult state.

Now, thanks to the work of the Scottish Expedition, we know that the species is extremely abundant at the South Orkneys; while the collections brought home enable me to describe all the stages of plumage from the newly hatched chick to the mature bird.

Although not nearly so numerous as its congener *P. adeliae*, yet next to that species it was the most abundant of all the birds found at the South Orkneys, where the total number resorting to Laurie and Saddle Islands for the summer is estimated at over one million.

This species was first seen by the Expedition on February 2nd, 1903, in lat. 60° S., to the N.E. of the Archipelago. Here a party was observed, some of which were sitting on an iceberg, others on the water. Two days later the first landing on the islands was effected at Saddle I., where the explorers met with a vast concourse of these birds, and a number of specimens, young and old, and some eggs were secured. The rookery at this island is believed to be tenanted by not less than 50,000 birds.

On her return to the South Orkneys in the autumn after the first voyage to the Weddell Sea, the 'Scotia' encountered Ringed Penguins off the east coast of Coronation I. on March 23rd. On March 26th she went into winter-quarters in "Scotia Bay," Laurie I., and there these birds were observed until April 28th, on which date the last of the autumn emigrants were seen. They were entirely absent during the whole of the winter; and the earliest of the

spring immigrants were noticed on November 2nd. On the following day a few more arrived, and the first bird to land walked straight up to a small moraine, picked up a stone, and laid the foundation of its new nest. After this date the immigrants were observed in varying numbers, many arriving on November 9th.

When walking over hard surfaces to reach their nesting-grounds, it was noticed that the birds maintained an erect position, marching in column of route; but when they came to soft snow they assumed a prone attitude and propelled themselves by means of their legs; when ascending a slope, or being chased, they brought their flipper-like wings into play, using them either alternately or synchronously; and when descending from any height they tobogganed.

Eight rookeries were found on Laurie I. The largest of these were at Cape Robertson and Ailsa Craig, each of which contained many thousands of nests. There were two other rookeries almost equal in size, but the rest were smaller, each tenanted by a few hundred birds, and situated at different places on the coast. On some of the off-lying Rudmose and Murray Islands there were jumbled rookeries of Ringed Penguins and Shags (*Phalacrocorax atriceps*). Dr. Pirie tells me that at Cape Robertson and Ailsa Craig the inhabitants of the great bird-cities were solely composed of the ringed species. At Cape Robertson, the birds occupied a strip of the coast about half a mile long extending over the low rocky foreshore and up the gently rising cliffs behind, until the farthest-inland birds must have been a couple of hundred yards from the sea, and at a height of two or three hundred feet above it. He reckoned that on average there would be about a nest to each square yard, and there could not have been much less than a quarter of a million birds. Here Dr. Pirie and two companions took 1000 eggs in a very short time on December 12th. Dr. Pirie had under more continuous observation a small congeries which had taken up its abode amidst the Adélie rookery at Point Martin, Scotia Bay. Here they constituted a small foreign element on fairly high ground,

with their congeners higher up as well as all over the ground between them and the sea. Although massed together they apparently get on with their neighbours as well (or as ill) as with each other. The nests were poor affairs composed of a few pebbles, varied occasionally by the bones of deceased ancestors. Woe betide the inhabitant of these cities and villages that strays beyond the boundaries of his or her domain; then the beaks of all the Penguins around dart out at the intruder and soon drive it back to its own territory. There was one point where the path up the cliff was very narrow, and here a constant stream of Penguins of both species used to go up and down on their way to the water. Right on the track were some nests of the ringed species, and how these birds managed to hatch their eggs is a mystery, for all day long they were incessantly engaged in pecking at the passers by, who, though often in a hurry, frequently stopped and retaliated. The cry of this bird is harsher than that of the other species, and during the breeding-season it is active and always on the move, though at other times it is solemn and phlegmatic in temperament. Its pugnacious disposition made a visit to the rookery a painful adventure, for the protection of long sea-boots did not always suffice. This bird is a good strategist and believes in getting in the first blow. Dr. Pirie has seen one take a run of several yards, jump, and fasten on to an intruder above his boots, at the same time lashing out vigorously with its flippers. When on the beach or ice-foot mingled with other species, the Ringed Penguins seemed always to take the lead in entering the water. They took the lead, too, in repelling the attacks of the Samoyede dog "Russ." He could out-manœuvre any Adélie or Gentoos Penguin, but he had frequently to retire before the onslaughts of the present species, which would face up to him and sometimes deliberately attack him. It was decidedly the "boss" and jockeyed both the Adélies and the Gentoos.

Occasionally three eggs are laid, usually two, and sometimes only one. A considerable number of eggs were obtained, and these vary in size from 7·70 cm. × 5·40 cm. to 6·95 cm. × 5·50 cm. A small egg, one of a clutch of

three, measured 4.43 cm. \times 3.92 cm. The average weight of fresh eggs was 3.56 oz. The eggs seem to be little known. They vary in shape, some being almost perfectly oval, others more elongate in form and narrower at one end. In colour the majority of those in the collection are of a uniform very pale greenish white, with a thin coating of a chalky nature, such as is found on the eggs of Cormorants (*Phalacrocorax*) and other birds.

The first chicks were found on January 7th, 1904, and appeared to be about two days old; but this was not at the rookery where the first eggs were laid. The young, though hatched considerably later than those of their congeners, seemed to develop more quickly, and by February 11th some of them were beginning to shew the characteristic black ring.

In the autumn of 1904 Mr. Mossman saw this species for the last time on April 26th. The first bird seen in spring was noted on November 14th, and the first eggs of the season were found on November 27th.

The collection of skins contains only thirteen specimens of the Ringed Penguin, but these represent the species in all stages of its plumage, and include a magnificent albino example.

The following is an account of the various stages of plumage, most of them hitherto unknown, passed through by this species.

Chick (Laurie Island, Jan. 7th, 1904).—The newly-hatched chick differs somewhat remarkably from that of its congeners, since it lacks the dark or black head characteristic of *P. adeliae* and *P. papua* and is entirely clad in silky-white down, except in the lower part of the abdomen, where it is partially naked. Bill black. Feet yellowish. (See figure Plate IV. It would have been more correct to figure this little bird in a nest rather than erect, but such a mode of treatment would not have shown it to advantage.)

Young in Down (Saddle Island, Feb. 4th, 1903).—There is a great change from the plumage of the chick to the full-grown

young in down. The latter is densely clothed in short down resembling fur, the upper parts of which are mouse-grey, passing into pale whitish grey on the head and cheeks; the hind-neck is tipped with white and the lores are blackish. The under surface is drab-grey, paler in the centre of the abdomen; the chin and throat are blackish. Bill black. Feet yellowish. Wing 4·9 inches. Culmen 1·4 inches. Tail-feathers 1·5 inches. (See figure Plate IV.)

Young in Down and Feathers (Eillium Island, Feb. 22nd, 1904).—Has blue-grey feathers on the lower back, tail, sides of the back, and on the edge and tip of the wing; a band of blackish feathers on the crown and hind-neck; lores feathered black, and the rest of the upper surface covered with mouse-grey down. Under parts with pure white feathers on the abdomen, lower breast, and chin; upper breast and neck in whitish down with a dusky band across the throat, under which the characteristic black ring or bridle is in evidence. Wing 6·3 inches. Culmen 1·35 inches. (See figures Plate IV.)

Immature Birds in First Plumage resemble the adults, from which they only differ in having the back almost entirely blue, *i. e.* shewing little black. Here, again, this species differs from its congeners, which have more or less pronounced colour-characters associated with their first plumage.

Adults.—The old birds on their arrival in spring (November) have the blue and black of the upper surface very bright in tint, but as summer advances (February) the blue fades and the black assumes a brownish hue. In February, too, some are in deep moult, the under down shews through the scanty covering of contour-feathers, the feathers on the wings are ready to drop off in patches, and the birds are quite tailless. In March and April the new plumage has been assumed, with the exception of the tail-feathers, which are still quite short, and yet these are the first to be assumed by the otherwise downy young. The wing in the adult males measures from 7·1 to 7·5 inches, and in females from 6·75 to 7·2 inches.

The average weight of seven adult males taken on the 4th of February, 1903, was 9·1 lbs., the smallest sealing 7 lbs. and the largest 11·75 lbs. Eight females averaged 8·65 lbs., the smallest being 6·75 lbs. and the largest 10 lbs. On February 9th, 1904, Dr. Pirie got specimens weighing as much as 17 lbs.

The albino is an adult female, and the plumage is *entirely* pure white with a silky gloss. The bill is black and the feet are orange. It was obtained on the south beach of Scotia Bay on the 2nd of February, 1904.

PYGOSCELIS ADELIAE (Hombr. et Jacq.). (Plate VIII.)

Pygoscelis adeliae Cat. B. xxvi. p. 632.

Thanks to the researches of the Expedition, the northern range of this truly Antarctic species has been considerably extended, and the South Orkneys and their neighbourhood now mark the extreme limits of its ascertained distribution at all seasons of the year.

The Adélie or Black-throated Penguin is no doubt a resident bird in the Archipelago, for it was observed there all the year round, though only occasionally during the winter months, which were probably spent on the open sea in the vicinity of the islands.

This bird was first noticed in lat. 60° 30' S. and long. 43° 40' W. on February 3rd, 1903, when the 'Scotia' was nearing the South Orkneys. A number were then observed swimming after the ship in company with *P. antarctica*, while others were seen on the ice either lying down or squatting. Those walking on the floes presented a comical appearance, their gait resembling that of an "old salt" just ashore after a long voyage. In jumping from the water on to the ice they made remarkable leaps of several feet, but were not always successful and fell back into the sea. The species does not appear to have been observed at Saddle I., but at Laurie I. it was the most abundant of all the Penguins, and its numbers during the summer were estimated at not less than five millions.

Though a few were noticed throughout the winter of

1903, it was not until October 7th (Oct. 8th in 1904) that the birds commenced to return to their summer-haunts. Over forty were then observed in Scotia Bay, most of them engaged in climbing up the rocks into the old rookeries as if they had come to stay. They were all in plump condition and travelled quickly, most of them moving on their bellies at full speed. On the 10th large bodies were making their way from the open water, and on arriving at the shore clambered up the rocks at once and made for the rookery. A party of these birds, accompanied by some Gentoos, was met *en route*, and as soon as the Adélie observed the intruders they hurried ahead, moving quickly on their bellies to meet the strangers, and on arriving moderately near they stood up, threw back their heads, and loudly screeched defiance; but they retreated on being approached, scuttling off in the prone position at full speed, followed by the more timid Gentoos.

Mr. Mossman noted that in the springs of 1903 and 1904 the first great arrivals of Penguins took place immediately after the last cold snap of the season.

At Laurie I. and its off-lying islets no less than fourteen rookeries of Adélie Penguin were discovered. The largest of these was located on the Ferrier Peninsula, which for several miles was simply alive with these birds and some Gentoos, the former being not less than two millions in number. Another vast colony was on Graptolite I. (Plate VIII. fig. 1), and there were smaller though still extensive rookeries on the west side of Scotia Bay, on Delta Island, Point Rae, and on Watson and Pirie Peninsulas, with numerous lesser settlements on other parts of the coast and on various small islands.

The favourite sites for these communities were on plateaux where small stones abounded, and these were sometimes occupied up to 500 feet above sea-level. As the season advanced these rookeries became indescribably dirty, being masses of mud with pools of filth, and the birds themselves became correspondingly defiled.

At the rookery in Scotia Bay the first signs of nest-building were noted on October 10th. By the 20th nearly

all were paired, and the appearance of an unpaired bird gave rise to a fearful commotion, every bird trying to get a billful of feathers from the unhappy one, while all the Penguins in the vicinity raised their voices and screeched their loudest. The appearance of such wanderers, too, generally resulted in a free fight among those around.

The nests were heaps of stones deliberately collected one by one from far and near, even from under the snow. They were hollowed in the centre, and lined with some bones of their departed brethren, or with dropped tail-feathers when procurable. Some of the birds sat on the snow until it was thawed down to the stones beneath, and then set to work to form an irregular hollow in which to lay their eggs. A number of the nests became covered with snow, in some cases a foot deep, and several were deserted in consequence. The birds are accomplished thieves, and start their knavish tricks as soon as nest-building commences, but do not entirely desist when the young are hatched, though they then practise them to a lesser extent.

Three eggs are sometimes laid, but two is the usual number, and not unfrequently one only. The first egg of the season was found on October 29th, 1903. On the 31st, 739 were gathered on Delta I., which was covered with these birds. Between November 2nd and 10th, 2075 eggs were taken for domestic use, and as late as the 21st a number were obtained from a small rookery in Scotia Bay. The sitting bird incubates in a procumbent position, the mate standing erect by her side. The period of incubation was ascertained to vary from 31 to 33 days.

This species is very bold as compared with the Gentoo, and attacks fiercely anyone who enters the rookery. The birds had always to be forcibly evicted from their nests if the eggs were wanted. It was quite a business to go through a rookery unless attired in long sea-boots, and even then the birds sometimes got at the intruder unawares, taking a running jump and fixing on his legs above the boot, whence they were not easily shaken off. Other Penguins passing the nests came in for violent assault, and some were seen

bleeding, while others were literally pecked to death. An angry bird ruffles the feathers on the back of its head and neck, draws back its head, and glares viciously with eyes and bill wide open. When the old birds leave the nest to go down to the water to bathe, it takes them a long time to make up their minds to enter the sea, and a whole crowd collects and walks up and down the ice-foot. They lean over the edge, as if about to dive, and then retire again and run off to another point to go through the same performance. When one makes the plunge a number of others immediately follow. After the dive they roll over and over in the water, and wash themselves thoroughly with the aid of their feet, gradually getting rid of the red dirt with which they are bespattered and smeared. On leaving the water they have to jump about four feet to reach the rock or ice. They often attempt to do this in places which are too high, and fall back into the water.

The first young were found on December 6th, but probably some of these were hatched on the 4th. Many were seen on the 11th. On the 18th a mother Penguin was observed feeding her chicks. She bent her head until her bill was inclined about 45° , *with the lower mandible uppermost*, and the chicks sucked in the semidigested food brought up, taking it from the hollow between the rami of the upper mandible. When the young were older they were fed as shewn in the picture (Plate VIII. fig. 2). Some young under a fortnight old were found to have already a small geological museum of pebbles in their stomachs. By January 7th, 1904, the young were beginning to lose their down. The rookeries at that date were in a greater state of filth than ever, and the stench was almost unbearable. On February 11th not a single old bird was in the rookery or in the bay, and only a very few young were seen. They had evidently all gone out to sea.

In 1904, Mr. Mossman informs me, the first spring immigrants were noted on October 8th, followed by several hundreds on the 14th, after which they were continually arriving at the rookeries. On November 2nd the first

egg was found, and the first chick emerged on December 12th.

The collections contain forty-five specimens, in all stages of plumage, from the South Orkneys ; also a large number of eggs.

As the various stages of plumage of this species have been carefully worked out from the material collected by the 'Southern Cross' Expedition, very little remains to be said on the subject. I would remark, however, that of the thirty-four adult specimens before me, obtained at all seasons, not one resembles the figure of the adult bird on plate vii. of the 'Southern Cross' Collections. In all the South Orkney specimens of this handsome species there is much less blue on the back, where black is the predominant colour, and the head and throat are almost entirely black, the feathers of the head being merely tipped with blue.

Immature birds shew more blue and less black on the upper surface than adults. Some obtained in February, and presumably about a year old, have the chin entirely black and the throat a mixture of black and white. And these same birds vary in the extent of the black apical spot on the under surface of the wing : in some it is developed, in others it is practically absent. This black apical spot cannot be regarded as a sign of maturity, as some young birds have it more developed than certain adults—indeed, one white-chinned example has this spot more pronounced than any other specimen in the collection.

A fine albinistic male was captured on the south beach at Laurie I. on January 11th, 1904. The plumage of its upper surface is cream-coloured, washed with pale brown on the hind-neck and crown ; the tail, wings, and under parts are white, except the chin and throat, which are brown and indicate that the example is an adult ; the bill and eyes were normal in colour ; and the feet pale on both surfaces.

A series of measurements taken in the flesh, and of the weights, revealed the fact that there was great diversity in the size of the adults. The males varied in total length from 28 to 33.1 inches, and their wings from 7.1 to

7.7 inches; the females from 27 to 30.8 inches, and their wings from 7 to 7.4 inches.

As regards weight, it would seem that by the end of the nesting-season the weight of birds of both sexes had run down to a low ebb, indicating, perhaps, that they had been drawing on the stores of fat laid up since the previous autumn. In April males ranged from 7.25 to 10 lbs., while in October the lightest bird scaled 11.5 lbs. and the heaviest 14.1 lbs. Females in April ranged from 6 to 8 lbs., and in October from 9 to 13 lbs. These results were based upon a large number of specimens.

The temperature of this species was found to be as high as 106° F.

PYGOSCELIS PAPUA (Forst.). (Plate IX.)

Pygoscelis papua Cat. B. xxvi. p. 631.

The Gentoo Penguin, which nears the southern limits of its range at the South Orkneys, was only found in small numbers as compared with its congeners, the total number at Laurie I. being estimated at 100,000 birds. It was confined to four or five rookeries, in which it nested in company with *P. adeliae*.

This species was first met with by the Expedition at Saddle I. early in February, though no mention is made of its nesting there, and later in the season it was observed off Coronation I. on March 23rd. At the winter-quarters in Scotia Bay many were observed departing late in March and early in April, and the last of the autumn emigrants went north on April 25th. Not all of them departed, however, for a few were occasionally seen during the winter months of May, June, and July. They increased in numbers during the third week of August, and the spring return movements set fairly in by September, on the 25th of which month they appeared at the rookery on Cape Dundas, while numbers arrived from the north as late as November 5th.

On October 18th many were observed on their way from the open water to a big rookery, in company with *P. adeliae*. On reaching the shore they at once clambered up on to the

rocks forming the breeding-ground. Here the Gentoos occupied the lower and less favourable sites, and formed a ring, as it were, round the Adélics. This was, no doubt, due to the fact that many of them wandered about aimlessly for some time ere commencing nesting, and thus allowed all the more desirable sites to be occupied by the other species.

The nest was a much better and larger structure of stones than that of its congeners, *P. adeliae* and *P. antarctica*, being from seven to eight inches high, and containing some old tail-feathers and a few bones. The birds, too, were cleaner than the rest all through the season. They were, however, great thieves, so far as pilfering nesting-materials was concerned.

On November 14th many of the nests became snowed up, and some of the birds sat in more or less deep holes in the snow; many, too, were completely covered.

The first eggs were laid on November 6th. They were usually two in number, frequently only one, never three. In shape they were very uniform, and rounder than those of *P. adeliae*. The period of incubation was found to vary from thirty-one to thirty-five days.

The birds are somewhat timid; a few of those incubating were bold enough to peck at human intruders, but the majority ran off their nests when approached. They were a little more courageous after the young were hatched, but even then some of them deserted their chicks without making any pretence at protection. They, however, fought fiercely among themselves, using both wings and bills, giving some hard smacks and sharp bites.

The young birds did not commence to lose their down until February 11th; but on one or two the white band across the crown had already begun to shew itself, and the neck to darken in colour.

The collection of skins from the South Orkneys contains specimens in all stages of plumage, and many eggs were also obtained.

The newly hatched chick is clad in silky down and is of an olive-grey tint on the upper surface (darker, nearly black, on

the head), but lighter beneath, and the bill is bluish grey. This stage soon gives place to a darker coat of down, to the tips of which the paler down of the first coat is attached for a time. In this second coat of down, the upper parts, including the head, are slate-grey, the plumes of the back having pale tips, and the under surface is white. When only a few days old, the bill begins to assume the orange tint characteristic of the adult birds.

The adults obtained in February are in faded plumage, and late in that month and during March and April had either moulted their tails or had that appendage only in an incipient stage of growth.

Eighty specimens, of mixed sexes, weighed on April 28th, 1903, varied from 8.5 to 13.75 lbs. Of these, the heaviest male scaled 13.75 lbs., the heaviest female 12.5 lbs.

CATARRHACTES CHRYSOLOPHUS Brandt.

Catarrhactes chrysolophus Cat. B. xxvi. p. 641.

The presence of this species at the South Orkneys is an interesting discovery, since it indicates a considerable extension in its hitherto-known range, for there was no reliable evidence before that the Macaroni Penguin had occurred south of the Falklands and South Georgia in the western Antarctic seas, or of Heard I. in their eastern waters.

Whether this species is an annual visitor, having breeding-grounds in the South Orkneys, must remain an open question; but it would seem not unlikely that such is the case, perhaps on some of the unexplored islands of the Archipelago.

Five specimens were obtained in 1904 in the Penguin-rookeries on Laurie I. These were mostly captured singly towards the end of summer, and are regarded as being more or less immature birds. Two of them, namely those last obtained, are decidedly younger than the rest, and have the merest indications of yellow feathers on the sides of the crown, and also small bills. The remaining three are considered to be not fully adult, and have well-developed tufts of golden-yellow (not orange) plumes, but

are otherwise mature in plumage and in the dimensions of their bills.

The two younger birds are, there can be little doubt, birds of the year, and their presence seems to point to the South Orkneys being their native land, for it is difficult to believe that birds only a few weeks old could have accomplished the rough sea-passage of 600 miles from their nearest-known breeding-station at South Georgia.

The three older specimens, though not fully adult, are probably about a year old, though whether this species breeds at such an age is uncertain.

None of these birds were observed in the autumn of 1903, when the Expedition arrived, and their appearance in the summer of 1904 was a surprise to the explorers.

The first specimen, a male, was captured on January 7th in a big Penguin-rookery at Scotia Bay, where it was found amongst a crowd of *P. adeliae*. Ten days later a female was secured in exactly the same place; and on the 29th of January another male, just below where the previous captures had been made. These three were the not fully adult birds alluded to, and the place where they were taken was so frequently visited that it is thought to be most unlikely that they could have been bred there without being detected.

One of the younger birds was taken higher up in the same rookery on December 29th, and the other was captured on the beach on February 6th. Both were males.

Regarding the age of these specimens I was somewhat uncertain, and sought the assistance of my friend Dr. A. E. Wilson, of the 'National' Expedition, who has had considerable personal experience with the allied *Catarrhactes schlegeli*, and whose aid it is a pleasure to acknowledge.

In connection with the occurrence of this species at the South Orkneys, it is well to recall the fact that Capt. C. A. Larsen, of the Norwegian sealer 'Jason,' informed Dr. Donald*, of the whaler 'Active,' that he saw a rookery of Crested Penguins on the South Orkneys. These birds he

* Cf. Proc. Roy. Phys. Soc. Edinburgh, xii. p. 335.

described as being intermediate in size between the Emperor and Adélie Penguins, and as having a yellow patch under each eye [? the yellow angle of the gape] and a red superciliary crest three or four inches long. This might well be regarded as a glorified description of fully adult examples of the present species.

It is probable, too, that this is the species of *Catarrhactes* observed and obtained by the Swedish Expedition on Nelson I., one of the South Shetlands, which was thought to belong to *C. chrysocome*. Most unfortunately the specimens were lost with the wreck of the Expedition (*cf.* Lönnberg, *Wiss. Ergebn. d. Schwedischen Südpolar-Exp. Bd. v. Lfg. 5, p. 3*).

[*APTENODYTES FORSTERI* G. R. Gray.

Aptenodytes forsteri Cat. B. xxvi. p. 626.

The Emperor Penguin claims mention for the South Orkneys on the strength of the following incident:—

On November 21st, 1903, two sailors reported having seen, by some open water at the mouth of Scotia Bay, a large Penguin, which was "three times the size of an Adélie," but having black feet and a bill like a Gentoo, though with no mark on the head like the latter species.

The bird unfortunately escaped into the water when the men attempted to capture it. There can be no doubt about the size of the bird having been correctly described, as the Adélies were close at hand for comparison. The two men who reported these facts were among the most careful and trustworthy of the crew, and the conclusion come to at the time was that the bird seen by them was an immature Emperor Penguin.]

OCEANITES OCEANICUS (Kuhl). (Plate X. fig. 2.)

Oceanites oceanicus Cat. B. xxv. p. 358.

Wilson's Petrel is a common summer visitor to the Archipelago, and though not nearly so abundant as either the Cape or Snowy Petrels, yet resorts in thousands to Laurie I. to nest on the cliffs of its remarkably extensive coast-line. It was also observed at Saddle I. during the

short visit of the Expedition on February 4th, 1903, and was probably breeding there.

In the autumn of 1903 it was last seen on March 23rd, as the 'Scotia' was approaching the islands from the south, on her first voyage from the Weddell Sea. It was never observed during the winter months, and did not appear until late in the spring, namely on November 11th *, being the last of the summer visitors to arrive. On the 23rd the ice broke up and many birds arrived, including numbers of this species. After this date it was constantly under observation, for several dozens took up their abode in the cliff above the observatory, where, on December 11th, the first egg was obtained.

There was no attempt at nest-making, the egg was simply laid in a hollow in the earth in narrow clefts and fissures in the face of the cliffs, under boulders, and sometimes under stones on the screes sloping from the foot of the precipice, at heights varying from 20 to 300 feet above sea-level. It was often placed far in, and this and the fact that the hole was so narrow made the egg difficult to procure. Some of the eggs were laid at such a distance from the entrance that a spoon had to be lashed to a long bamboo in order to reach them. The searchers could hear the low whistle uttered every few seconds by the sitting bird, but on reaching the spot whence it seemed to proceed the sound would appear to come from an entirely different direction. The dog "Russ" proved to be a great aid in work of this kind, for he easily detected the bird's presence by his keen sense of smell. When caught on the egg the birds brought up a reddish fluid, which issued both from the mouth and nostrils. In addition to the low whistle, these Petrels had a harsh screaming chuckle. These noises they kept up almost continuously after dark, especially on still nights.

They appear to return year after year to the same nesting-

* This and other species appear to be remarkably constant as to the times of their appearance and departure at the South Orkneys. As an instance of this, it is interesting to note that Mr. Mossman observed the first Wilson's Petrel in the spring of 1904 on November 12th.

places, for both eggs and dead young birds of previous seasons were numerous in the tenanted holes containing the fresh eggs. This fact indicates that a very serious waste of life takes place in some seasons, if not annually. It may be accounted for by the late arrival of the bird at its breeding-stations, which, coupled with the lengthened period of incubation characteristic of all Petrels, results in winter setting in ere the eggs are hatched, or the young, which develop slowly, are old enough to leave the nesting-holes. Another, and perhaps more probable, explanation is that the disasters noticed were due to a succession of cold summers, which are actually known to have occurred. None of the eggs in the summer of 1903-04 had been hatched when the Expedition left the islands on February 21st. These facts would seem to indicate that the South Orkneys lie at the extreme limits of possible breeding for Wilson's Petrel. Indeed for many individuals of this species, perhaps all, during some seasons the climatic conditions place the islands distinctly beyond that range; though it breeds further south, most likely with similarly disastrous results.

From 7 to 11 P.M. these birds flitted about the cliffs and over the head of Scotia Bay in great abundance, and in striking contrast to their habit in the day-time, when only occasionally was one to be seen on the water, though there were probably many at sea off the islands.

The nest figured (Plate X. fig. 2) was situated at the bottom of a crack in the rock, about four inches wide and two feet deep. It was the only one found which was open enough to permit of a photograph being taken, and then only under particular circumstances as to time. At about 7 A.M. the sun shone for a few minutes directly into the crack, and it was during those moments that this unique picture was secured.

Eight eggs average 33.7×24 mm. The largest is 36×24 mm., and the smallest is 32×23 mm.

FREGETTA MELANOGASTER (Gould).

Cymodroma melanogaster Cat. B. xxv. p. 364.

On December 5th Dr. Pirie discovered a pair of unknown

Petrels. He heard a low whistling sound proceeding from a crevice in a rock on the east side of Uruguay Cove, Laurie I., and about fifteen feet above the sea, and on climbing up found what he at first thought to be a pair of Wilson's Petrels, and managed to secure the female. Two eggs, badly broken in the endeavour to capture the birds, were found near the mouth of the crack—one of them obviously of a previous season, the other deeply incubated.

On examining the captured bird it was at once evident that it was not a specimen of *Oceanites oceanicus*, for it had entirely black feet, had white on the under surface, the feathers of the back slightly edged with white, a longer and more hooked mandible, and strongly upturned nasal tubes. On the return of the Expedition, I found this bird to be an example of *Fregatta melanogaster*—the Black-bellied Storm-Petrel.

The dimensions of the egg secured were 3.60×2.55 cm., and correspond with those of *F. melanogaster*, from the Falklands and Kerguelen, in the British Museum Collection. The locality was again visited in the hope that the escaped bird might be found. It was not there, however, nor were other individuals of this species observed elsewhere in the islands.

The occurrence of this species is one of the most interesting ornithological discoveries made by the Expedition. It implies a remarkable extension in its known range, and removes the doubt which has hitherto overshadowed (*cf.* 'Antarctic Manual,' p. 228) the record of its having bred at South Georgia as mentioned by Pagenstecher ('Die Vögel Süd-Georgiens,' p. 18, 1885) in the Southern summer of 1882–1883.

THALASSÆCA ANTARCTICA (Gm.).

Thalassæca antarctica Cat. B. xxv. p. 392.

A few examples only of the Antarctic Fulmar were seen at the South Orkneys; but it is thought by the members of the Expedition that it may possibly have bred on the east side of the Ferguslie Peninsula, along with the Cape and Snowy Petrels, in the summer of 1903.

A number of these birds were seen in the previous autumn when the 'Scotia' was between Saddle I. and Cape Bennet, the northern limit of the Powell Is., on March 23rd, 1903. Several were again observed on the following day in Lewthwaite Strait, between Coronation I. and the Powell Is.

On June 1st, when winter was well advanced, Mr. Bruce noticed one flying round the 'Scotia'; and another is believed to have been seen at the open water in Scotia Bay on August 17th.

There are no South Orkney specimens in the Collection, but a number had been obtained in the Weddell Sea before the Expedition arrived at Laurie I. and went into winter-quarters there.

PRIOCELLA GLACIALOIDES (Smith).

Priocella glacialoides Cat. B. xxv. p. 393.

The Slender-billed Fulmar, or Silver Petrel, was observed in the summer of 1903, in MacDougall Bay, on the north coast of Laurie I., on November 4th. After this date examples were occasionally seen about the cliffs on the north side of the island during November and December, and it is considered highly probable that a few pairs were nesting there. The breeding-places of this bird, however, still remain to be discovered.

This species was first observed during the previous autumn, when a number came under notice between Saddle I. and Cape Bennet, the north end of the Powell Is., on March 22nd, 1903; and again on the following day when the 'Scotia' was in Lewthwaite Strait, between Coronation I. and the Powell Is., in search of winter-quarters. It was also seen in numbers off the N.W. end of Coronation I. on February 14th, 1904.

It had been seen commonly, and specimens obtained, in the Weddell Sea just prior to the date of the above observations.

PAGODROMA NIVEA (Gm.). (Plate III. fig. 1 and Plate XI. fig. 1.)

Pagodroma nivea Cat. B. xxv. p. 419.

The Snowy Petrel of Cook was not only an abundant

summer bird, but was by far the most numerous of the few species which remained for the entire winter at the South Orkneys.

In summer it frequented the high precipitous sea-cliffs which formed its breeding-haunts, and where, during the nesting-season, some 20,000 birds were estimated to be present on Laurie I. alone. It was never seen on the hills at the head of the ice-sheets.

It was also found at Saddle I. and was nesting there. The single eggs were laid under rocks, in caves, and in holes and crevices on the steep cliffs facing the sea, at heights ranging from a few to several hundred feet above the water. The nests were rough primitive structures and consisted of a few stones or a little earth. They were less accessible than those of the Cape Petrel, and mostly isolated; but in one cave under Mount Ramsay a dozen or more eggs were taken. This bird does not fly off when its nest is approached, but retreats a little, and ejects an oily fluid at the intruder, uttering all the while shrill cries. (See Plate XI. fig. 1.)

The first eggs were obtained on December 2nd, but were not quite fresh. By the 4th all the birds seemed to have laid, and eighteen eggs were found, most of them in a cave from twenty to twenty-five feet above sea-level. The cave was thickly carpeted with the dung, and the nests, unlike the rough examples outside, were all well formed in the dung and had a few feathers in them. Some were placed as much as forty feet from the entrance, where it was almost dark. In 1904 the first eggs were observed on November 25th (*Mossman*).

Young birds were found on January 28th, 1904, but the parents were not present with their chicks—not an unusual circumstance during the daytime with certain birds of this order. When discovered these chicks uttered the same harsh notes as are characteristic of the old birds. Their stomachs were found to be crammed with crustaceans.

The young bird does not seem to have been described. One about one-third grown, and captured on January 28th, 1904, is clad in long fluffy down which almost conceals the

feathers appearing on the wings and tail. The down is of a lavender-grey tint on the back and chest, darker on the head, and dull ivory-white on the abdomen. (See figure 1, Plate III.)

OSSIFRAGA GIGANTEA (Gm.). (Plate XI. fig. 2.)

Ossifraga gigantea Cat. B. xxv. p. 422.

The Giant Petrel was present at the Station all the year round, but was very much less numerous during the winter months. There was a decided falling off in May, but the lowest ebb was reached in June and continued until September, when the summer birds of this species commenced to arrive. During the nesting-season it was estimated that about 5000 were on Laurie I. alone, and when one remembers the savage nature and almost insatiable appetite of these giants, it is easy to realise what a terrible scourge they must have been to the Penguins, upon which and their eggs and young it was their one aim to gorge themselves to repletion.

They were to be seen everywhere in the summer-time, but their rookeries were confined to the north and east coasts. Three of these rookeries were visited, two of which, namely those on the Watson Peninsula, contained two hundred nests each, while the third at Cape Geddes comprised only about one hundred. One of the larger colonies was situated on bare rocky ground from 300 to 400 feet above sea-level, and the other on a moraine at an elevation of from 250 to 300 feet. The nests consisted of great piles of small angular stones, and were about two feet in diameter. The third and smaller rookery was on a low strip of ground between a cliff and the shore, and was close to the sea; the nests were similar to the others. Although these contained no eggs on November 3rd, yet the birds allowed a close approach, one of the parents sitting on the nest, the other usually standing close alongside.

The first eggs were laid on November 4th, but four only were found on that date. On the 19th, however, eighty were obtained, all single specimens, except in two instances where two were found, probably laid by as many females. The birds had to be pushed off the nests ere the eggs could be taken,

for very few flew away of their own accord. They shewed no fight when evicted, and usually sat down a yard or two away; nor did they shoot oil from their nostrils, but they vomited the contents of their stomachs, not as a mode of defence, but to get rid of ballast in order to take wing. They resorted to the same lightening process when chased. Unfortunately, the weather-conditions and those of the ice did not permit of these rookeries being again visited, so that the period of incubation could not be ascertained nor the capture of young be effected.

The average length of 80 eggs was 10.38 cm. and the breadth 6.57 cm.

This species was observed on Saddle I., and was thought to be breeding on the adjacent rocks.

The heavy toll ruthlessly demanded from the Penguins was very manifest on visiting their rookeries. Here abundant remains of recently killed young Penguins, in the shape of clean-picked skins and bones, were lying all around, while the gorged feathered giants were either waddling about or sleeping off the effects of their orgies on the neighbouring snow-slopes. They were observed to feed on dead seals, and during the winter resorted to the ship's refuse-heap in search of scraps of meat. They were very bold when in want of food, and one swooped down close to the cook and tore a piece of flesh off a dead Penguin.

The proportion of birds in pure white plumage in the rookeries was not more, perhaps less, than two per cent. The colour of the birds ranged from very dark brown through all shades of chocolate, and from grey through light grey and mottled white to white. Some of these facts indicate interbreeding between the two forms and, perhaps, between their offspring and typically coloured birds and others. Dr. Pirie thinks that they interbreed, because he has no recollection of seeing two white birds together on the nesting-grounds.

Four specimens in the collection are from the South Orkneys, and two of these are of the white form. The weight of these birds varied from 7.25 to 10 lbs.

DAPTION CAPENSIS (Linn.). (Plate X. fig. 1.)

Daption capensis Cat. B. xxv. p. 428.

Although the Cape Petrel or "Cape Pigeon" is one of the most familiar birds to voyagers in the southern oceans, and one, too, that has been known since the days of Dampier (that is to say, since the closing years of the 17th century), yet the eggs remained entirely unknown until December 2nd, 1903, when Dr. Pirie took the first specimens at the South Orkneys.

The three nests from which eggs were then obtained were placed on open exposed ledges of cliffs on the west side of Uruguay Cove, Laurie I., at heights of from twenty to a hundred feet above sea-level. The nests were composed of a few small angular fragments of rock and a little earth, and contained single eggs, which were quite fresh. When approached, the sitting birds ejected an evil-smelling reddish fluid composed of the semi-digested remains of crustaceans of the genus *Euphausia*. It was extremely disagreeable to the collector to receive it in his face when peering over a ledge, and the odour of it was found to cling to clothes for a very long time. The birds can squirt this fluid with great precision for a distance of six or eight feet. They did not leave their nests readily, and even allowed themselves to be captured while sitting. The pure white eggs seemed very large for the size of the bird.

On December 3rd three more eggs were obtained. There were six nests on the ledge where they were found, but three of them were empty. On the following day about two dozen eggs were taken on the cliffs under Mount Ramsay, and on the 5th some fifty eggs were found on the cliffs on the east side of Uruguay Cove. The birds seemed to be of a sociable nature, for several were frequently found nesting near to each other on the same ledge, but isolated nests were not uncommon.

The work of collecting the eggs of this species proved to be such an unpleasant business, owing to its nasty methods of defence already alluded to, that a long ski-pole was used. With this the birds were pushed off their nests, and the eggs

secured without the captor being defiled. When thus removed they took short flights, and then alighted near the nest. Both birds were often found sitting side by side (one on the nest and the mate close alongside) and cooing and clucking to each other, though not to the same extent as during the month previous, when courtship was in full swing.

On December 12th more eggs were procured from the locality in which they were obtained on the 5th, and the nests robbed on that day, though still empty, were covered by sitting birds. On January 13th, 1904, a fresh egg marked on December 2nd was found chipped, so that the period of incubation was not less than forty-two days. On January 18th a chick five days old was taken for a skin, and young birds were still in down on February 5th, after which date the state of the ice did not permit of further observations being made ere the Expedition left for the far south.

It was noted that before laying its eggs this Petrel sits close on the nest for about a month, and it was also observed that it entirely disappeared from its nesting-haunts for some ten days before the first eggs were laid.

The eggs vary from oval to elongate-ovate in form. Taking two extreme forms, I find their dimensions to work out as follows:—Oval type, 56.5×43 mm.; elongate-ovate type, 67.2×43.3 mm. The average of a large number of specimens is 62.35×43.11 mm. The length varies from 56.5 to 67.2 mm. and the breadth from 46.5 to 40.5 mm.

In 1904 the first eggs were laid on December 3rd, or one day later than in the previous year (*Mossman*).

The numerous nests found were placed either on ledges of cliffs, or, though these were few, in hollows in the earth and among small stones on steep scree-slopes, and all were quite open. These are noteworthy facts, for the nests (containing young) found previous to the discoveries of the Scottish Expedition were obtained *in burrows and grottoes* on the Island of Kerguelen. There is little doubt that the Cape Petrel breeds at South Georgia, and Mr. Mossman tells me that he saw it in numbers off Deception I., one of the South Shetlands, in the height of the nesting-season.

This species is a summer visitor to the South Orkneys. In the autumn of 1903 it was only once seen after April 21st, on which date a flock was observed flying north. It was entirely absent during May, June, July, August, and September. The first of the spring immigrants was seen on October 1st, but the bird was not noted again until the 23rd, after which date it became frequent.

About 20,000 resort to Laurie I. for nesting-purposes, and they are found in hundreds all round the coast. In Uruguay Cove alone there were over one hundred accessible nests, and many others were out of reach. They also nest on Saddle I., where both young and old were obtained on February 4th, 1903, and are doubtless abundant throughout the other islands of the Archipelago, which may be regarded as a metropolis of the species.

They were never observed flying over the land, but were to be seen on the wing in front of the cliffs (not wheeling high over them, like *Pagodroma nivea*) or sailing over the sea.

The chick in down, five days old, taken on January 18th, 1904, is slate-grey above, and paler and sooty on the under surface.

A young bird obtained at Saddle I. on February 4th, 1903, has the head and body clad in down, with feathers developing on the wings and scapulars. The down on the upper surface is sooty (darker on the head and cheeks) and paler and greyish on the under parts. The wing-quills, the largest of which are 2 inches in length, are black, some of them with the inner webs white towards the base. The feathers of the scapulars are black and white. There are no signs of tail-feathers. Wing 8 inches.

The mature birds from the South Orkneys and the Weddell Sea present two types of plumage. The first of these, which perhaps represents old birds in weathered dress, were captured towards the end of summer (in February) : and in them the dark portions of the plumage are blackish with a brown cast, the head alone being black ; the feathers of the mantle have whitish bases ; and the marginal and lesser

coverts shew less white than in the next form. In the second type the dark portion of the plumage is slate-black, and the bases of the feathers of the mantle are dusky. Specimens in this phase were obtained early in the autumn (late in March), and are either in new or first plumage. A male captured on the nesting-ledges on December 3rd, 1903, is intermediate in plumage between these two forms.

PRION BANKSI Gould.

Prion banksi Cat. B. xxv. p. 434.

This "Whale-Bird" fairly claims a place in the avifauna of the South Orkneys on the strength of specimens seen off Coronation Island, within the territorial waters of the Archipelago, on November 27th, 1903, the day on which the 'Scotia' left her winter-quarters to proceed to the Falklands to refit.

It had been frequently observed on the outward voyage of the previous year, but fell off rapidly in numbers as the pack-ice was entered, and ceased to be noted some sixty miles ere the South Orkneys were reached. It was also seen, and specimens were obtained at sea, to the eastward of the group during the early days of the first voyage in the Weddell Sea.

The Wandering Albatros (*Diomedea exulans*) was frequently seen between the Falklands and the South Orkneys, but became gradually scarcer as the latter Archipelago was approached. There are only two records in the Log referring to the presence of an Albatros at the South Orkneys—namely, a young bird seen when off the islands on February 3rd, 1903, and one or more noted on the following day Saddle Island, but the species in both cases is uncertain.

The Albatroses *Thalassogeron chlororhynchus* and *Phœbæria fuliginosa* were constantly seen on the voyage from the Falklands to within about sixty miles of the South Orkneys, between January 26th and February 1st, 1903. *Phœbæria cornicoides* approached still nearer, almost to Saddle I.

STERNA HIRUNDINACEA Less.

Sterna hirundinacea Cat. B. xxv. p. 52.

The White-rumped Tern was first observed by the Expe-

dition at Saddle I. on February 4th, 1903. It was not found to be an abundant species at Laurie I., where only some two or three hundred spent the summer, nesting in small scattered colonies of about a dozen pairs, and also in isolated pairs.

In the spring of 1903 the first Terns of the season were observed on October 21st, but it was thought that some had been heard two or three days before. The bird had been absent from the island since the 25th of March of the previous autumn.

The nests were mere hollows, lined with a few small fragments of stone, on the tops of small rocks, or on raised beaches and small scree, and were always quite close to the shore. The nests in the colonies were placed fairly close together, and often in proximity to those of *Larus dominicanus*. When not surprised on their nests, these birds usually betrayed the whereabouts of their treasures by hovering over them and screeching loudly.

The eggs were one or two in number. The first were found on November 14th, and from that date onwards they were observed until January 15th. In 1904 Mr. Mossman records the first eggs observed on November 27th.

The earliest chicks were obtained on December 25th, and by February 7th young were noted as having lost all their down.

A few adult specimens and a chick are included in the collections; also a number of eggs, averaging 4.73 cm. \times 3.34 cm.

This species is also a summer visitor to the South Shetlands. But according to Reichenow the South Georgian bird is a subspecies of *Sterna vittata*, which he has named *Sterna vittata georgie* (Orn. Monatsber. xii. p. 47); while the same authority has described (*l. c.*) the Tern of the Antarctic continent as a race of the Arctic Tern, *Sterna macrura antistrophe*.

LARUS DOMINICANUS Licht.

Larus dominicanus Cat. B. xxv. p. 245.

This Black-backed Gull has a remarkably wide latitudinal distribution, ranging as it does from 10° S. in the South Atlantic to within a few degrees of the Antarctic Circle.

It was not a very abundant species at the South Orkneys,

and the numbers visiting Laurie I. as a summer resort did not exceed some three hundred birds. It was also observed at Saddle I. in the late summer, and had apparently been breeding there.

The chief nesting-haunts on Laurie I. were at Point Davis on the south coast and Uruguay Cove on the north. At each of these places about a dozen nests were found. Elsewhere it was found less abundantly, mostly in isolated pairs, all round the coast.

The Southern Black-backed Gull was one of the few species that was observed all the year round, for some of them braved the severities of the winter, and were seen more or less frequently in the neighbourhood of the Expedition's winter-quarters at Scotia Bay.

The return of the spring immigrants commenced in mid-October. The birds were seen pairing on November 3rd, and the first eggs were laid on November 15th (on the 23rd in 1904 (*Mossman*)). The first young are mentioned under the date of December 26th, and are described as being then about a week old. Fresh eggs marked on December 3rd were found chipped on the 28th, indicating an incubation-period of about 25 days. Young still in down were observed as late as January 30th, 1904.

The nests were placed on raised beaches, small screes, and rocks within a few yards of the shore. The nest was a well-built structure of seaweeds, mosses, lichens, and feathers; and was usually surrounded by great quantities of limpet-shells, this mollusk being evidently a favourite food of the bird. The eggs were usually two in number, but sometimes three were found, and occasionally only one.

On April 15th Messrs. Bruce, Pirie, and Wilton saw an entirely white Gull, resembling in all other respects this species, of which it may have been an albino specimen; and on September 21st an almost white example of this Gull was seen, in which the wings and upper surface were much lighter than usual.

The collection contains skins of this species in various stages of plumage and a number of eggs.

MEGALESTRIS ANTARCTICA (Less.).

Megalestris antarctica Cat. B. xxv. p. 319.

About five hundred Antarctic Great Skuas spend the summer on Laurie I., taking up their quarters in the vicinity of the Penguin-rookeries, where they revel among the eggs and young of their neighbours. They were also observed nesting in similar situations on Saddle I.

During the southern autumn of 1903 they were seen daily until the 28th of April, on which date the last bird of the season was met with. They were entirely absent during the winter months, and the first spring immigrants were noted on October 16th. These were followed by a few others on the 26th, after which they gradually became abundant.

On November 22nd two Skuas, presumably males, were observed fighting fiercely, while a third was looking on, evidently an interested spectator. The birds fought with bills and claws for nearly an hour, when one of them became quite exhausted; and then the victor flew off with his bride, and the vanquished was ruthlessly torn to pieces and devoured by a Giant Petrel, which had been an interested spectator of the fight.

The first eggs were laid on December 2nd, and young birds a week old were found on January 29th. By February 11th, dark feathers were appearing on the wings and sides of the breast of these youngsters.

The period of incubation was not precisely ascertained, but was believed to be about six weeks.

In the spring of 1904 the Skuas returned on October 21st; and the first eggs were found on November 27th (*Mossman*).

The nests were usually placed on the tops of mossy rocks, or on plateaus from 100 to 400 feet above the sea, and consisted of well-made hollows in the moss, while teased-out fragments of moss formed the lining. Occasionally nests were found on the tops of moraines and were then hollows in the earth lined with lichens.

The eggs were two in number, and on these the bird sat very close, her mate usually remaining near at hand. When

the nest was approached the owners screamed defiance, and if the eggs were wanted the sitting bird had to be forcibly ejected from the nest—not a very pleasant proceeding, as the sentinel bird wheeled above and dashed at the head of the intruder, though never actually striking him. When a dog, however, appeared upon the scene both birds swooped down on it, and sometimes struck it with their wings. The nests were surrounded by many shells of eggs and remains of young Penguins. The young—pretty little masses of light brown down—soon wander away from the nest, and are most difficult to detect among the moss, which they closely resemble.

These birds were to be seen incessantly hovering over the Penguin-rookeries, and swooping down ever and anon at the sitting birds to snatch their eggs or young. On such occasions the Penguins combined in screeching at the harpies, but to little purpose.

Many were about the house all the summer, being attracted by the remains of Penguins thrown out by the cook. Nearly one hundred were observed around a seal's carcase; while dead Giant Petrels, and even deceased members of their own species, did not seem to come amiss as food.

Numerous specimens were obtained at the South Orkneys. These vary in colour, though mature and obtained at identical periods. Specimens captured in November, soon after their arrival on the nesting-grounds, were of two types. One had the ground-colour of both upper and under surfaces dark, being of a deep blackish brown, rather paler below, and shewing comparatively few light markings on the mantle and scapulars, indeed in some specimens the back is practically uniform. The other type is less numerously represented in the collections, and is much paler (drab) generally, except on the head; while the feathers of the interscapular region and under surface have grey-buff margins. In these light-coloured birds the yellow streaks on the neck are much more numerous and pronounced than in the darker birds; and they agree with the form described by Saunders (*Brit. Mus. Cat. Birds*, xxv. p. 320) as inhabiting the Falklands, except that they are not smaller in size than the ordinary dark form.

their wings measuring 16.65 inches, as against 16 to 17 inches in the last mentioned. The Falkland-Island bird has recently been described by Lönnberg (Wiss. Ergebn. d. Schwedischen Südpolar-Exp. Bd. v. Lfg. 5, p. 8, 1905) as a subspecies under the name of *M. antarctica falklandica*.

It is of interest to remark that one of these light birds was observed to be mated with one of the dark examples.

MEGALESTRIS MACCORMICKI (Saund.).

Megalestris maccormicki Cat. B. xxv. p. 321.

Mr. Mossman informs me that a specimen of McCormick's Skua was procured by the Argentine naturalists at Laurie I. on November 11th, 1904, and is in their collection of birds. Mr. Mossman saw this bird in the flesh and examined it, and he tells me that it was quite different from the Skuas, light or dark, which bred at the South Orkneys. This South-Polar bird has not hitherto been obtained so far north as the South Orkneys, indeed I believe not outside the Antarctic Circle.

CHIONIS ALBA (Gm.). (Plates III. fig. 2, XII., & XIII. fig. 1.)

Chionis alba Cat. B. xxiv. p. 710.

This Sheathbill, the "Paddy" of the explorers, was an abundant species, and though chiefly a summer visitor to the islands, yet wintered in small numbers at Scotia Bay, being attracted by the refuse cast out from the ship. Some wintered away from the ship at the seal-haunts on the north side of the island.

In the summer it was present in all the Penguin and Shag rookeries, as many as two hundred haunting some of the larger colonies (see Plate XII.). Altogether it is believed that from 2000 to 3000 of these birds passed the Antarctic summer of 1903 on Laurie I. alone. Adults and young birds were present in considerable numbers at Saddle I. on the occasion of the Expedition's visit early in the previous autumn, namely on February 4th, 1903.

It was also fairly abundant around Scotia Bay in March, but towards the end of April, when the temperature approached zero, the numbers fell off considerably, and when

winter-conditions became fairly established only some twenty or thirty remained, and for many days during that drear season were the only living creatures observed. These pensioners eked out an existence on the refuse odds and ends which were daily thrown out from the 'Scotia.' One of the birds became very tame, and for a number of days in succession visited the ship, remaining all day either in the fo'c'sle or in the galley.

Late in September and during the first half of October many returned to their summer-quarters, and their numbers greatly increased when the ice broke up on November 23rd.

The first eggs were found on December 11th, when eleven (two clutches of three, two of two, and a single egg) were taken, but some of these proved to be considerably incubated.

A nest found on December 3rd was on a ledge under an overhanging rock, and was composed of small stones and Penguins' tail-feathers. Five nests were found on the 11th in the large Penguin-rookery in Scotia Bay: four of these were on the fringe of the colony and quite low down, being only from ten to twenty feet above sea-level, and placed in crevices of rocks or underneath boulders on the moraine; while the other nest was under a large boulder about one hundred feet up the moraine, and right in the midst of the Penguins (see Plate XIII. fig. 1). These nests were mainly composed of the shells of Penguins' eggs, bones, and feathers, and a number of limpet-shells. The position of the nest is not difficult to detect, for one of the birds generally sits on a rock close by. The eggs are usually three in number.

Fresh eggs marked on December 11th hatched on January 7th, an incubation-period of twenty-eight days. The newly-hatched young are clad in brown down and shew conspicuous bare patches; they are not by any means pretty objects like the young Penguins and Skuas. On January 29th white feathers were beginning to develop under the down of these chicks; and by February 11th the down had nearly all disappeared.

These birds were found to be very tame and unwilling to

fly; indeed, some of them would not take wing when pushed with a stick, and most allowed an approach to within striking distance ere they walked leisurely away.

In the Penguin-rookeries they were to be seen perched in prominent places, on the look-out for dead birds or broken eggs. They are very bold, and one was observed to abstract an egg from under a sitting Shag, which was somewhat disconcerted at having its photograph taken for the first time. Sheathbills were seen to revel in garbage of every description, including the excrement and placentæ of seals. Crustacea were found in the stomachs of some of those dissected.

The young bird figured (Plate III. fig. 2) is about one-third grown. The wings, scapulars, and flanks have white feathers with a little down. The head, sides and back of the neck, lower part of the back, and abdomen are clad in grey down mottled with brown.

The temperature of an adult bird, taken on March 26th, 1903, was found to be 107°·3 F.

The collection contains a few skins of adults and the young bird described, also a small number of eggs. The latter are elongate-ovate in shape, and in colour white boldly blotched with greyish black or dark brown and liberally freckled with the same tints. They do not vary much in size, and measure from 54 to 58 mm. in length by 37 to 39 mm. in breadth.

PHALACROCORAX ATRICEPS King. (Plate XIII. fig. 2.)

Phalacrocorax atriceps Cat. B. xxvi. p. 390.

It had long been known that a species of *Phalacrocorax* nested in the icy regions of the Antarctic, for Ross found a "Cormorant" breeding at Louis Philippe Land, and saw innumerable examples at Cockburn Island on January 6th, 1844. The specific identity of these Antarctic Shags remained somewhat uncertain until the Scottish expedition finally settled the matter at the South Orkneys in 1903.

The Blue-eyed Shag, as our explorers termed this species, was present all the year round in the Archipelago.

In summer it was numerous, but avoided the main islands and sought nesting-places on small islets or rocks off the coast of Laurie and Saddle Islands, where it was estimated that about two thousand five hundred pairs were breeding, and where some of the rookeries contained as many as two hundred nests. In winter it was much less numerous, but the species never escaped observation for many days in succession.

On August 2nd a flock containing several thousands, probably early immigrants, was seen from the 'Scotia' as she lay in her winter-quarters.

The first eggs were obtained on November 8th, on a small islet some forty feet high situated off the north coast of Laurie Island, where a few Ringed Penguins were also nesting. The nests were well-built structures composed of seaweed, moss, lichens, and feathers. Some of the birds were still engaged in nest-building, and were diving and bringing up masses of seaweed in their bills, while others were busily engaged in picking mosses and lichens off the rocks. They were great thieves, even worse than the Penguins, for when the more timid of the nest-builders retreated on the approach of the explorers, the bolder birds immediately carried off the momentarily deserted materials for their own use. A few only of the nests contained eggs, mostly one apiece, though some had two; and the conclusion was arrived at that the birds had only just commenced laying. Many of the nests were on rocks, some of them in the sites of previous years; while others were on pinnacles of ice, having been built on snow which had gradually thawed away all round the nest, but not at its base. The sitting birds were very confiding, and allowed themselves to be stroked on their nests. On the following day, November 9th, another nesting-colony was found on a small bare islet. Here many of the nests contained three eggs, and the rock between them was in a terribly unsavoury condition. The usual number of eggs was two, but three were not unfrequent. The eggs varied in size from 51 to 67 mm. in length, and were 41 mm. in breadth.

It was unfortunately impossible to visit these rookeries

later in the season ; and there were none within reach of Scotia Bay, though some birds rested every night on the rocky islets in the bay in December, where no signs of their nesting were apparent.

There are a number of skins in the collection in both adult and immature plumage and a considerable number of eggs.

Adult males shot in September have the crest well developed, the feathers being from 1·5 to 1·75 inches long. A male shot in December has a much shorter crest, and others of the same sex obtained in February are devoid of these ornamental plumes. The September specimens are much more brilliant in plumage than the rest of the adults, and also have the nasal caruncles more developed. The white dorsal patch varies much in size, even in adult males obtained at the same season ; and in one captured in December it is represented by a narrow band of white blotched with black across the middle of the back. The culmen of adult males varies from 2·2 to 2·5 inches and the wing from 11·8 to 12·1 inches. Weight 6·5 lbs.

The bird in first plumage has not, I think, been described. One obtained in December has the upper surface hair-brown, tinged with green on the back, where the feathers have narrow margins of a lighter brown ; the head and hind-neck shew a few darker feathers ; outer scapulars and tail whitish, the shafts of the latter dull light green ; primaries and secondaries dusky with a faint greenish tinge ; wing-coverts edged with dull white, with a narrow buff-white alar band below the marginals ; under wing-coverts brown ; under surface white ; thighs brown. These young birds shew no signs of a white dorsal patch. Slightly older birds obtained in February have their upper plumage a mixture of brown and metallic feathers, and one specimen shews slight indications of a white dorsal patch ; the central tail-feathers are blackish with white shafts, and the rest of the plumage is as in the younger bird.

DESCRIPTION OF THE PLATES (III.-XIII.).

Plate

- III. Young of *Pagodroma nivea* (p. 170) and *Chionis alba* (p. 182).
 IV. Young of *Pygoscelis antarctica* (p. 152).
 V. Sketch-map of the South Orkney Islands (p. 145).
 VI. Ringed Penguins courting (Brown's Bay) (p. 152).
 VII. Ringed Penguins nest-building (Brown's Bay) (p. 152).
 VIII. fig. 1. Adélie Penguins' Rookery on Graptolite Island (p. 157).
 fig. 2. Adélie Penguin feeding its young (p. 157).
 IX. fig. 1. Departure of Gentoo Penguins (Scotia Bay, April 1903)
 (p. 162).
 fig. 2. Gentoo Penguins and their nests (Scotia Bay) (p. 162).
 X. fig. 1. Cape Petrel with its egg (p. 174).
 fig. 2. Wilson's Petrel on its nest (p. 166).
 XI. fig. 1. Snowy Petrel by its nest (p. 170).
 fig. 2. Giant Petrel, white form, nest and egg (Cape Geddes)
 (p. 172).
 XII. White Sheathbills on their nesting-ground (MacDougall Bay)
 (p. 182).
 XIII. fig. 1. White Sheathbill on its nest (p. 182).
 fig. 2. Blue-eyed Shags and their nests, Rudnose Rocks (p. 184).

XI.—Notices of recent Ornithological Publications.

1. *Allen on Birds from Santa Marta, Colombia.*

[Supplementary Notes on Birds collected in the Santa Marta District, Colombia, by Herbert A. Smith, with Descriptions of Nests and Eggs. By J. A. Allen. Bull. A. M. Nat. Hist. vol. xxi. pp. 275-295 (1905).]

In 1900 Dr. Allen published in the 'Bulletin of the American Museum of Natural History' (xiii. p. 115; see 'Ibis,' 1901, p. 319) a list of the birds collected by Mr. Herbert Smith in the Santa Marta district of Colombia. A more recent shipment received from the same district, also made by Mr. Smith, contained about 350 bird-skins and a large collection of nests and eggs. With these the total number of species now recorded from Santa Marta is 392. The present paper contains additions and corrections to the former list, and descriptions of the nests and eggs forwarded by Mr. Smith, as already mentioned. Only those identified in a "fairly positive" manner are dealt with.



H. Goodchild, a.s.l. et lith.

YOUNG OF (1) PAGODROMA NIVEA. (2) CHIONIS ALBA.

Bale & Danielsson, Ld. imp



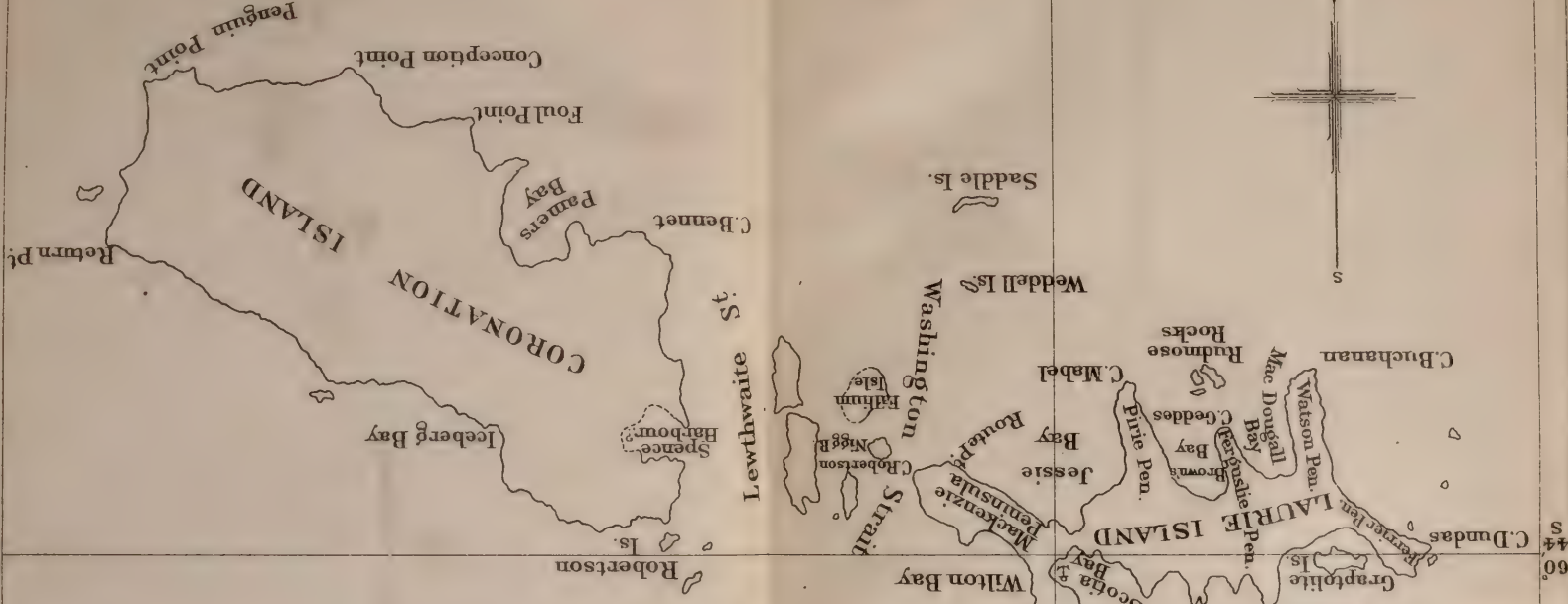
YOUNG OF PYGOSCELIS ANTARCTICA.

Painted by Danieleson, lith. imp.

H. Goddard, del. et lith.

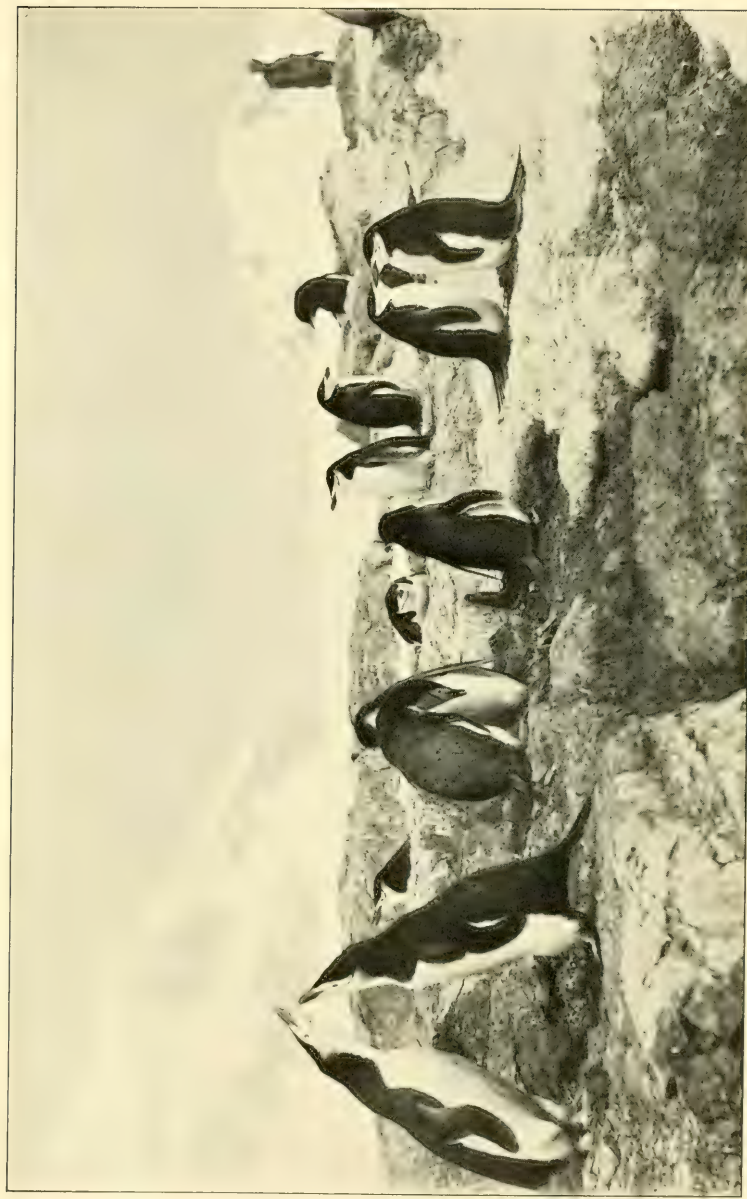
SOUTH ORKNEY IS

SKETCH MAP
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RINGED PENGUINS nest-building (Brown's Bay)



ADELIE PENGUINS' Rookery on Graptolite Island.



Bale & Danielsson, Ltd.

ADELIE PENGUIN feeding its young



Departure of GENTOO PENGUINS (Scotia Bay, April 1903)



Bale & Danielsson, L^{td}

GENTOO PENGUINS and their nests (Scotia Bay)



CAPE PETREL by its nest.

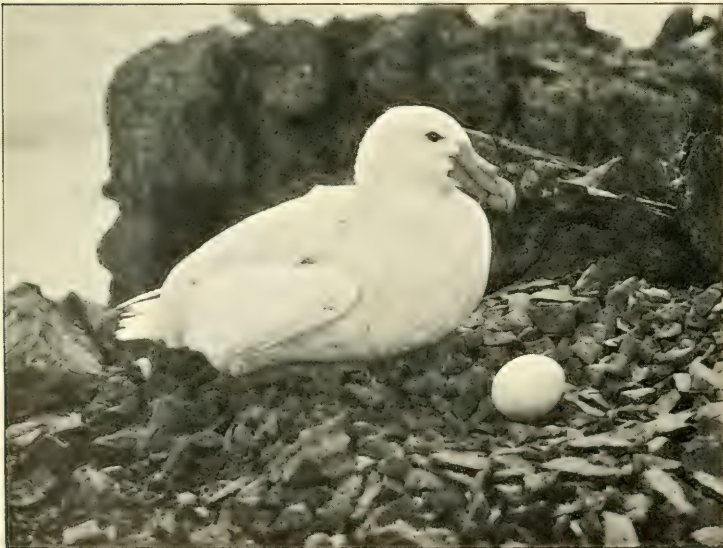


Bale & Danielsson, Ltd

WILSON'S PETREL on its nest.



SNOWY PETREL by its nest.



Bale & Danielsson. Ltd

GIANT PETREL (White form) nest, and egg (Cape Geddes.)



Bale & Danielsson, Ltd

WHITE SHEATHBILLS on their nesting-ground (Mac Dougall Bay.)



WHITE SHEATHBILL on its nest



Bale & Danielsson, Lt^s

BLUE-EYED SHAGS and their nests (Rudmose Rocks)